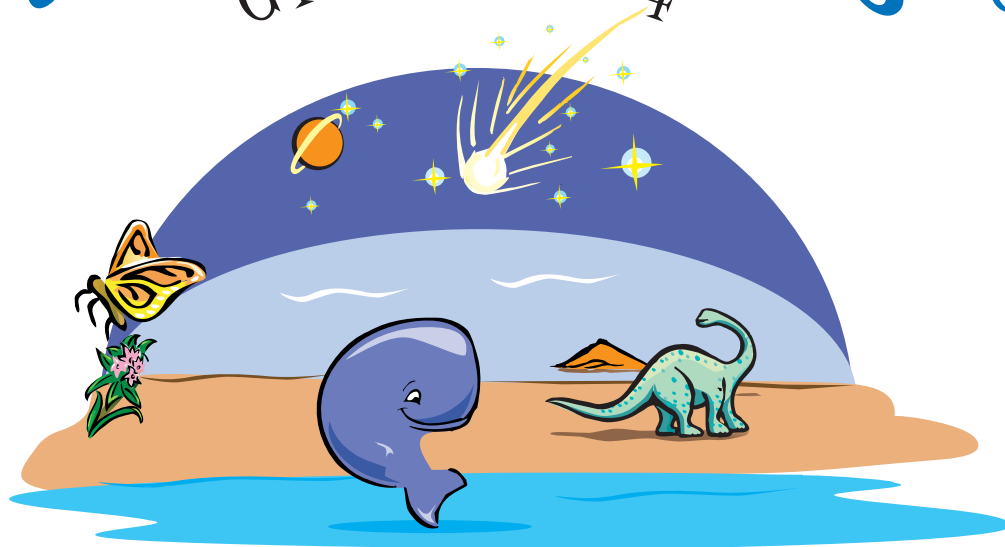




TeacherVision Books  
*presents*

# Science Experiments and Activities

Grades K-4



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# The Brown Bag Energy Test

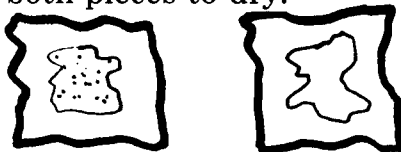
Fatty foods provide us with energy. If we eat too many, the body stores them as fat. Let's do the "brown bag test" to see which foods do contain fat.

## Materials Needed:

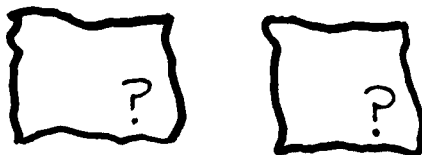
- water
- eyedropper
- paper
- pencil
- brown paper bag
- variety of foods, such as salad dressing, boiled egg, nuts, bread, melted butter, leafy vegetable

## Procedure:

1. Tear the brown paper bag into two-inch pieces.
2. Put two or three drops of melted butter on one piece of brown bag paper.
3. Put two or three drops of water on another piece of brown bag paper.
4. Hold both pieces of paper up to the sunlight. **Notice:** They are *both* letting some light through. We say that they are "translucent."
5. Allow both pieces to dry.



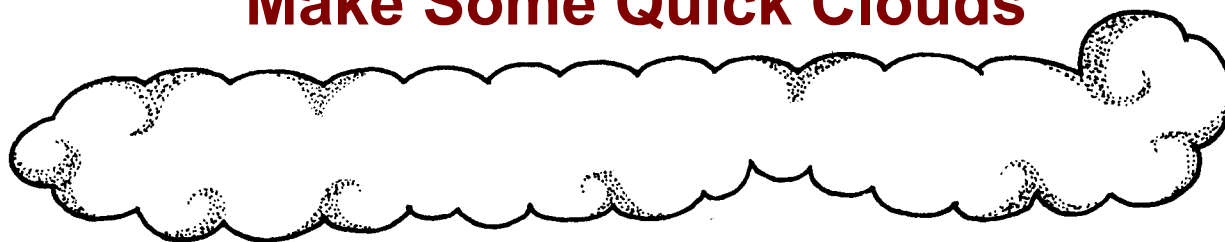
6. Hold both pieces up to the sunlight again. Are they *both* still letting light through? Are they both still "translucent?"



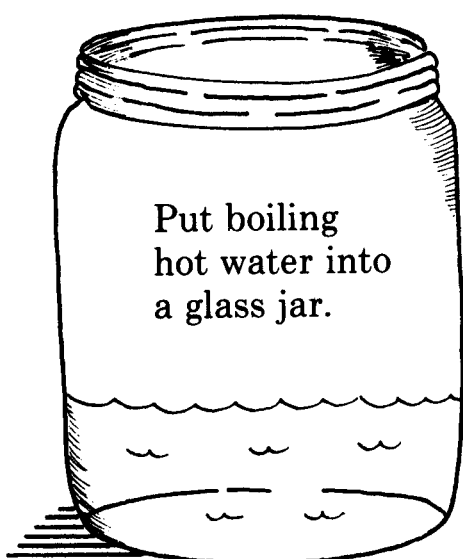
7. Fatty foods, like the melted butter, leave a permanent stain on the paper. *That's your "Brown Bag Energy Test" system at work.*
8. Use other foods, and follow the same procedure for the energy check.
9. Record your findings. Make a list of the foods you found to contain fat, and those in which you did not detect fat.
10. Do the "brown bag test" at home on some of your favorite foods and snacks such as pizza, French fries, peanut butter, and meat. Make a record of your findings on a big brown paper bag. Bring them to class to share.



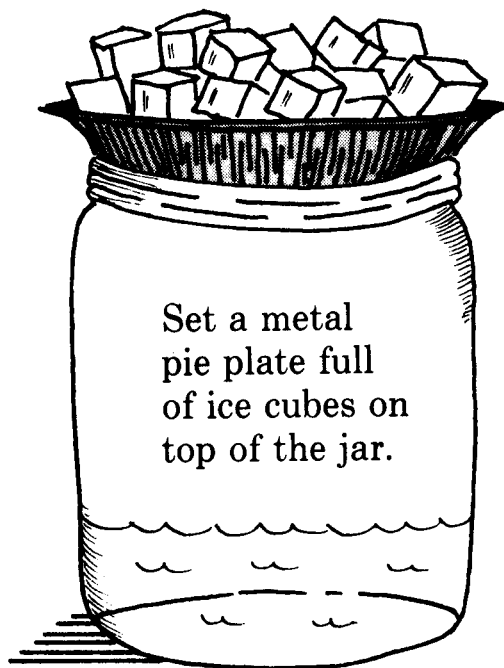
# Make Some Quick Clouds



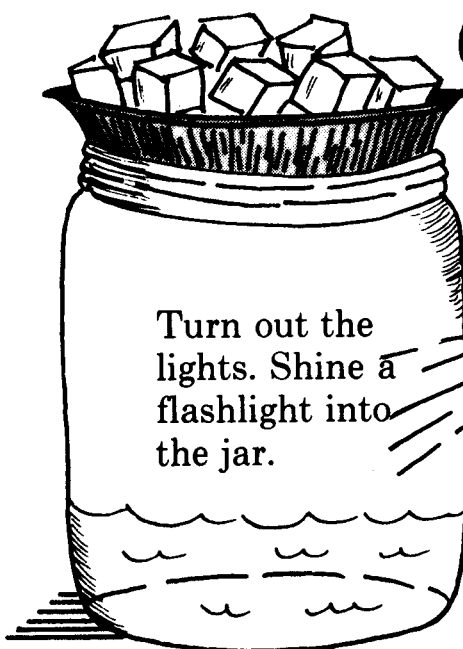
Clouds are formed when moist, warm air meets cold air. You can make your own clouds by following the directions below.



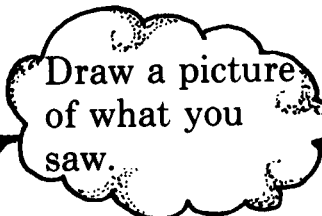
Put boiling hot water into a glass jar.



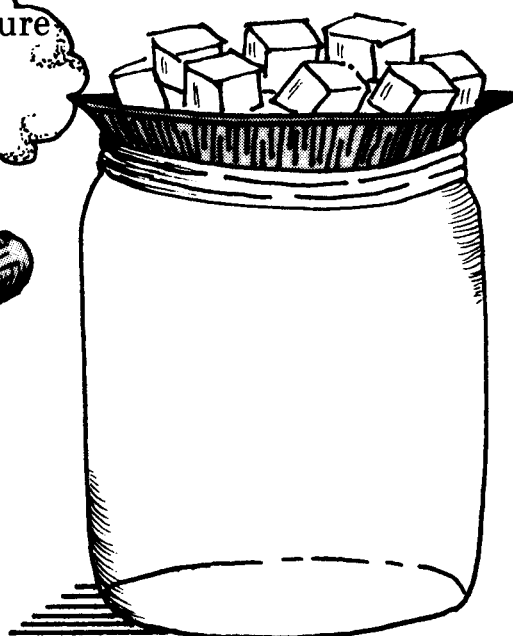
Set a metal pie plate full of ice cubes on top of the jar.



Turn out the lights. Shine a flashlight into the jar.

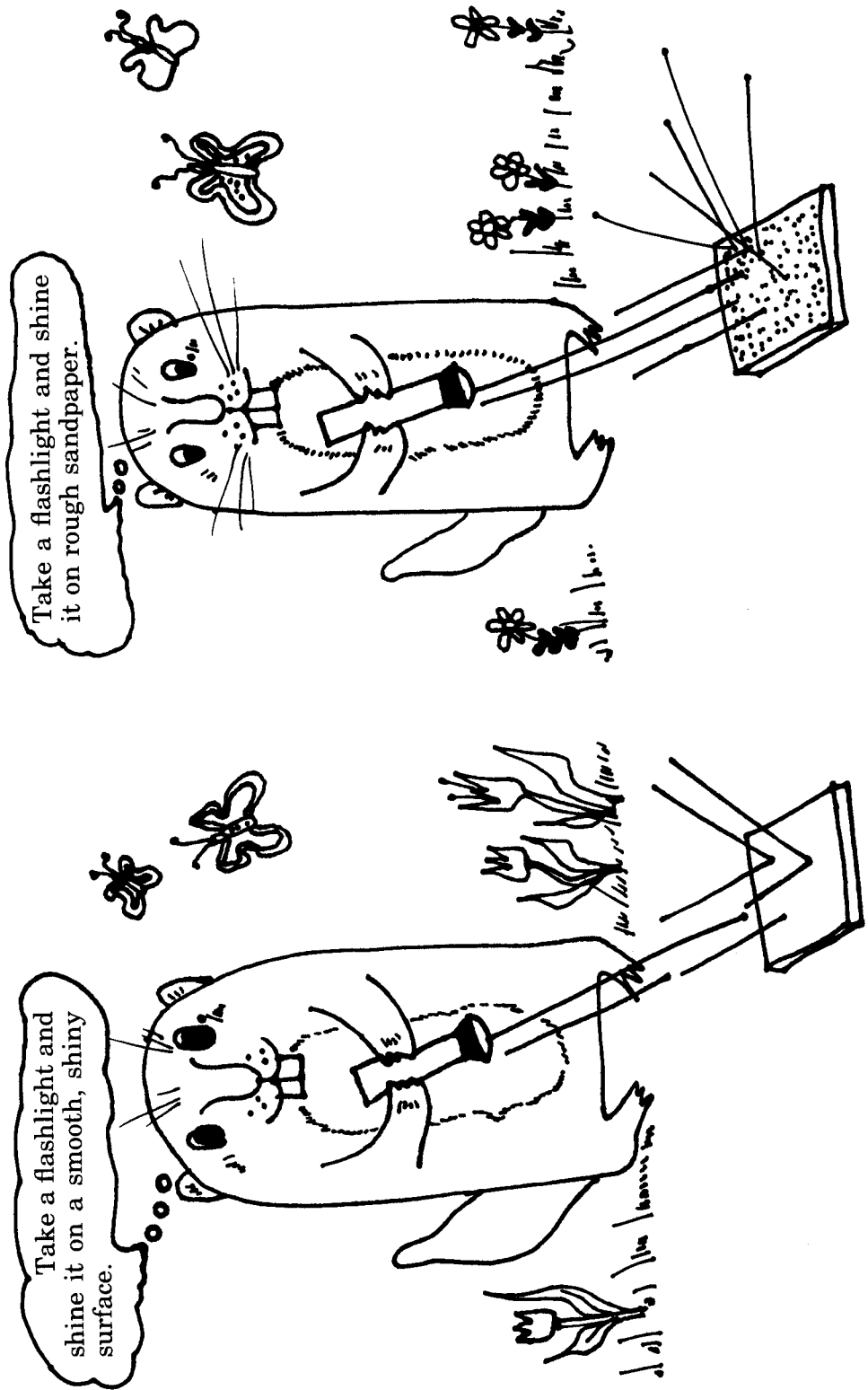


Draw a picture of what you saw.



# Investigating Reflection of Light

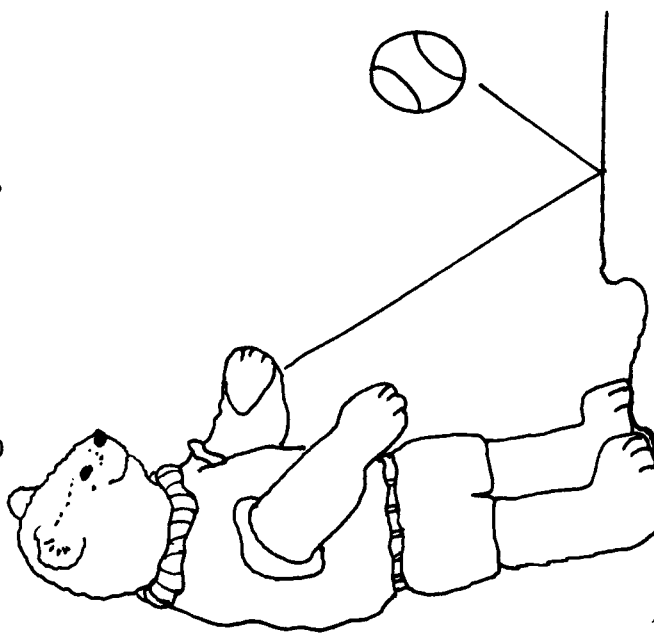
These two beaver brothers are curious, just like scientists are. They are studying the angles of light reflection today and they want to see if light reflects (bounces off) all items in the same way and at the same angle. The beaver brothers are telling you what you will need for your experiment. What did they discover about rough and smooth surfaces?



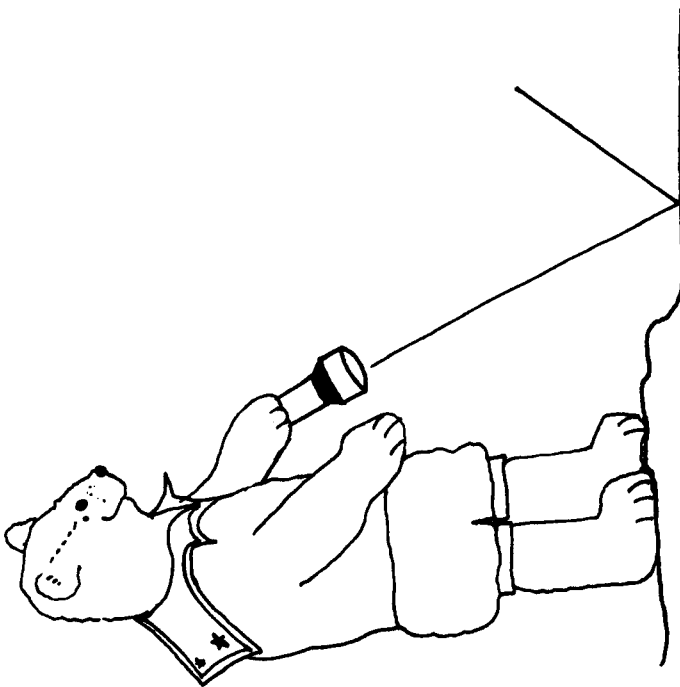
# B.J. & T.J. Bear Discover Light Reflections

You can try this experiment right along with B. J. and T. J. Bear. You will need a rubber ball, a mirror, a flashlight, and a darkened room. Ready? First, bounce the ball straight up and down. Second, bounce the ball at an angle to your partner. Notice the angle of the ball as it approaches the floor and compare it with the angle of its path as it leaves the floor. How do they compare? Third, place the mirror on the floor. Fourth, hold the flashlight straight over the mirror, and then “bounce” the light from the flashlight off the mirror.

Compare the angles of light approaching and leaving the mirror. How do they compare to the angles of the bouncing ball? Are they the same or are they different?



Notice the angle of the bouncing ball.



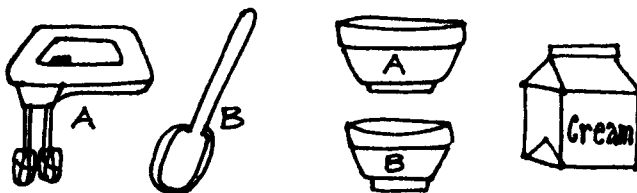
Notice the angle of the light reflection.










# The Whip Cream Experiment

This experiment helps us to see that machines make our work easier. Do machines shorten the time needed to complete this experiment?

Materials:



Procedure:

1. Open the container of heavy cream  and pour half into  and half into .
2. Put the electric mixer  next to .
3. Put the spoon into .
4. Divide the class into two groups—Group A and Group B.
5. GROUP A—Whip the cream with the electric mixer. Take turns. GROUP B—Whip the cream with the spoon . Take turns. Check the cream at one minute, two minutes, three minutes.
6. What happened? Write the results in the spaces below.

Group A

Group B



# Night Lights

Look for things that give off light at night. Color them. Cross out the things that do not give off light at night.

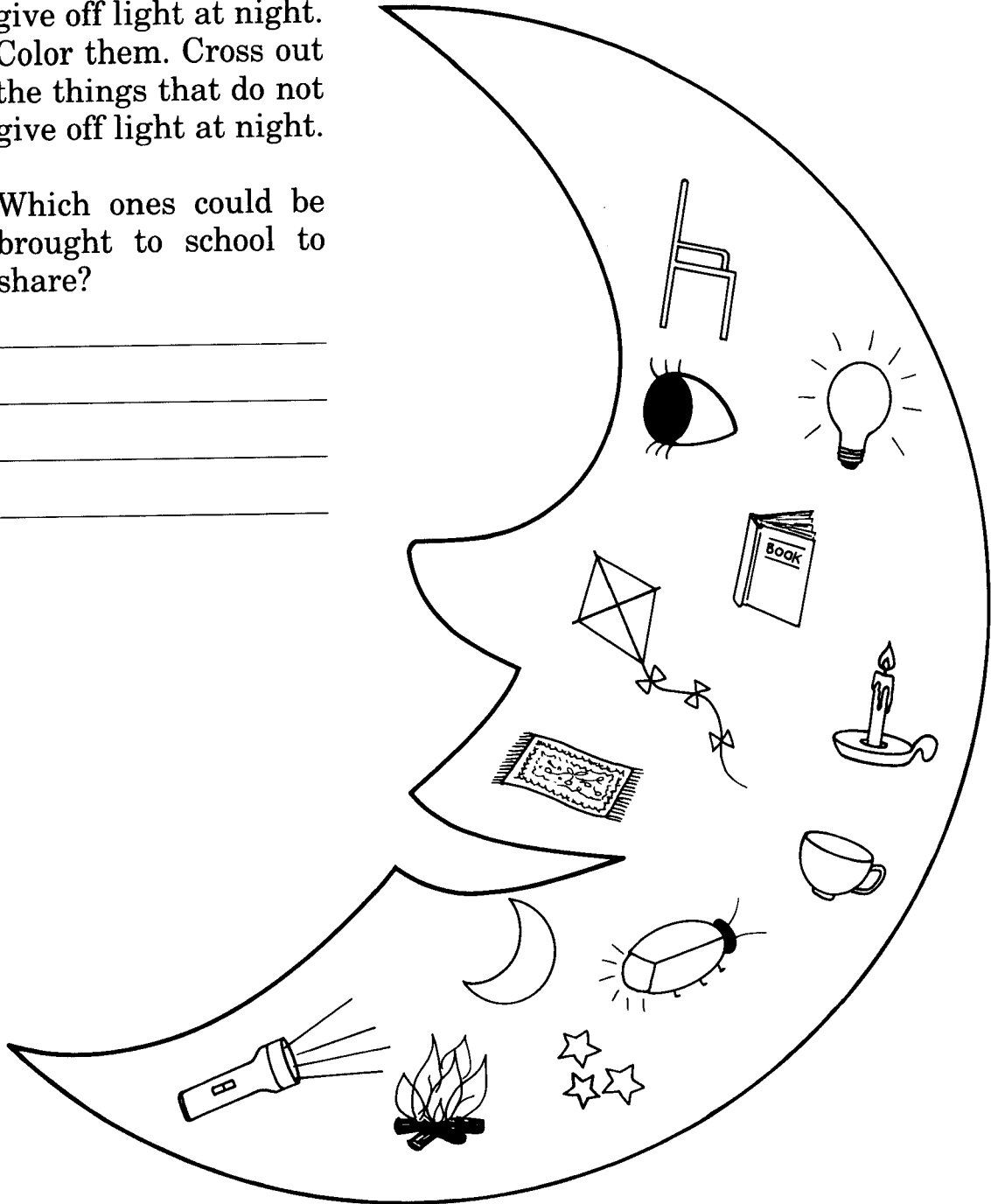
Which ones could be brought to school to share?

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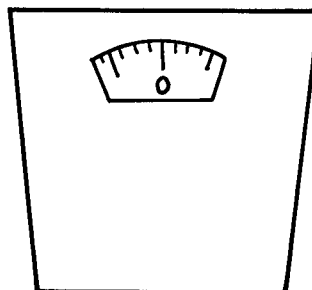
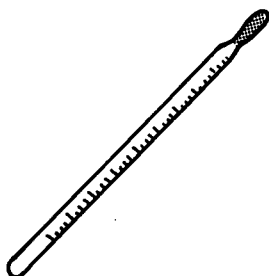
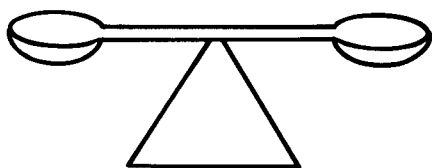
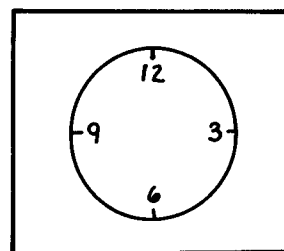
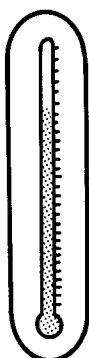
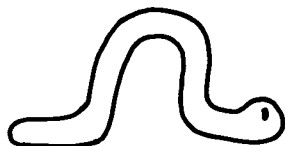




# Inch by Inch. . .

Directions:

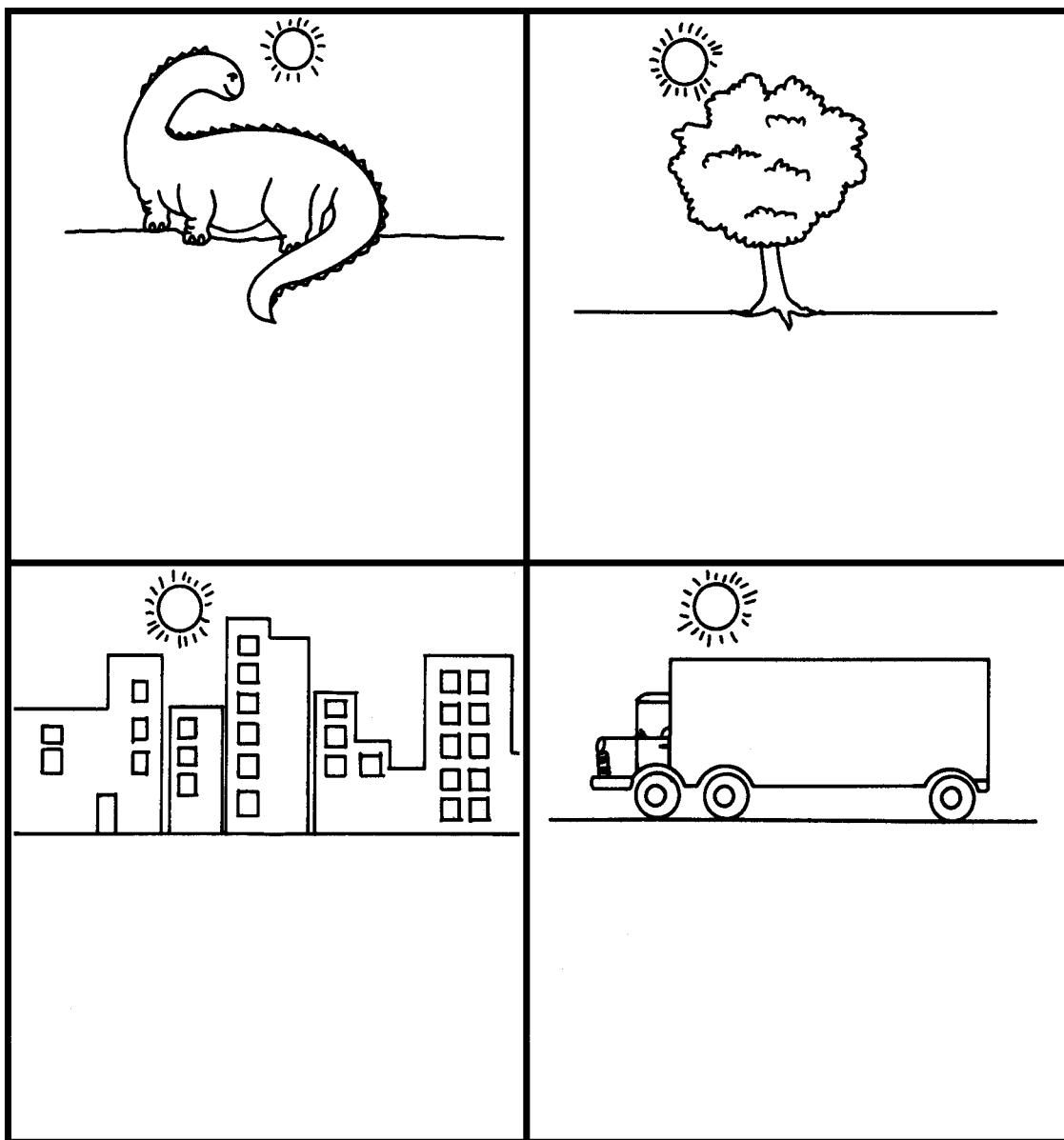
- A. Put an  $\times$  on the instruments that tell how heavy.
- B. Put a  $\triangle$  on the instruments that tell how long.
- C. Put a  $\bigcirc$  on the instruments that tell how hot or cold.



# Creating Shadows

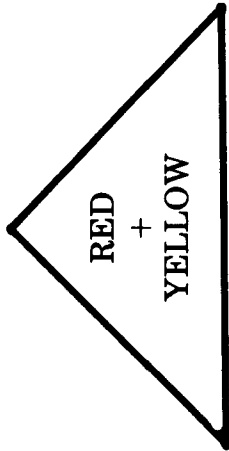
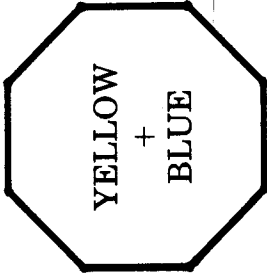
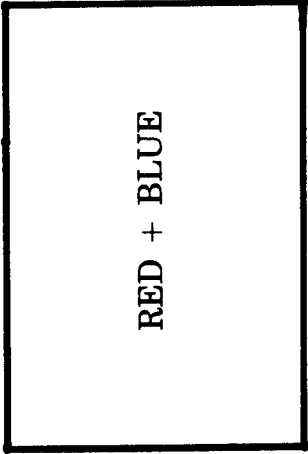
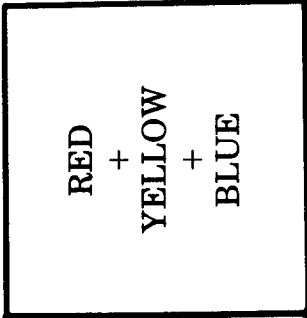
Did you know that a shadow happens when light is blocked by a solid object?

Look at the pictures below and color them. Then draw and color their shadows black.



# Color Combinations

Red, yellow, and blue are called **PRIMARY** colors. We can mix them together in different combinations and different amounts and come up with even more colors. These new colors are called **SECONDARY** colors. For this experiment, you will need food coloring, plastic containers, and water. Start mixing. Record your findings below with your crayons by coloring the big shape with the color that resulted in mixing the primary colors.

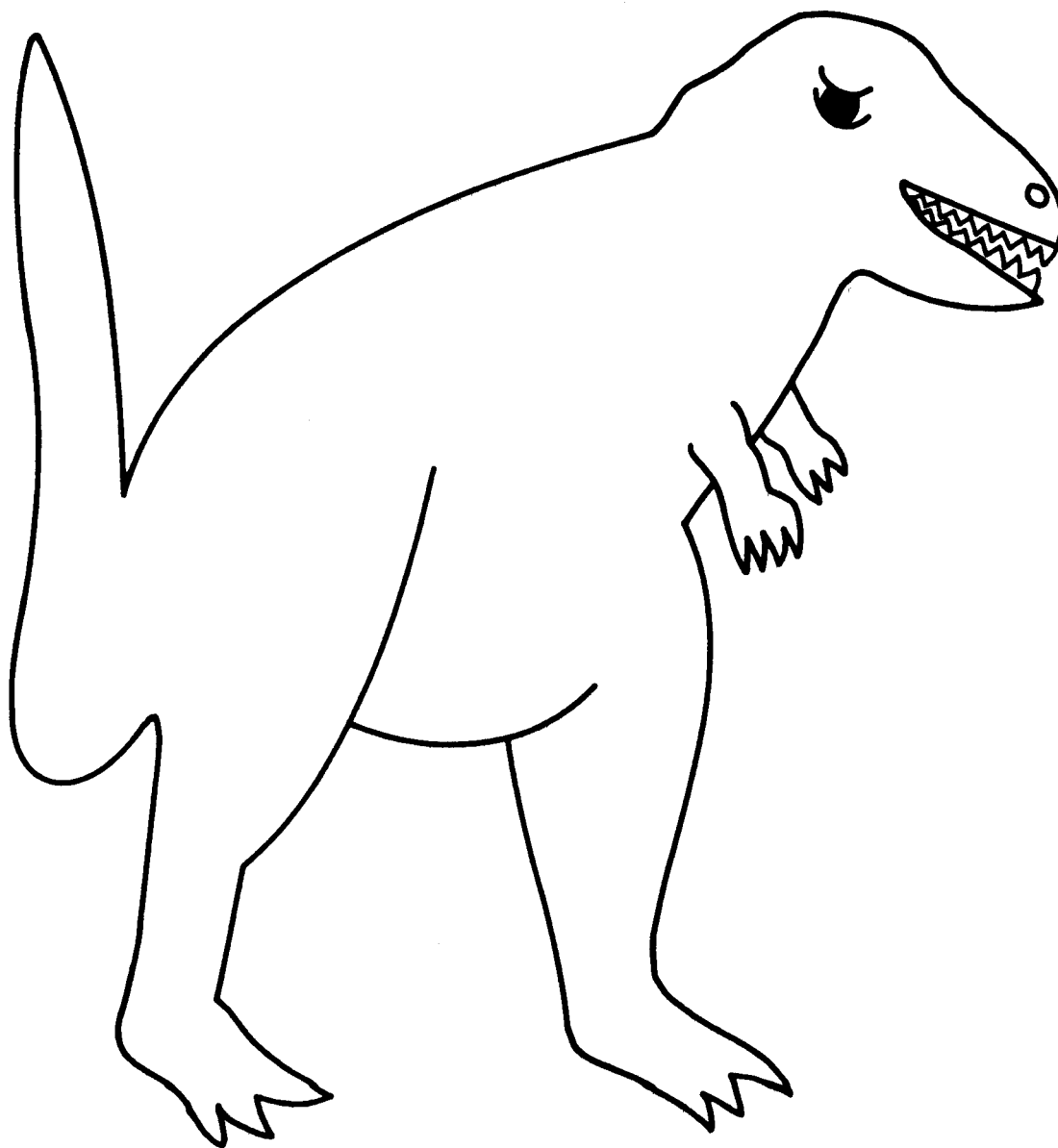
 <p>RED + YELLOW</p>	 <p>YELLOW + BLUE</p>
 <p>RED + BLUE</p>	 <p>RED + YELLOW + BLUE</p>



## Measure Me!

My name is REX. Can you please help measure my parts?

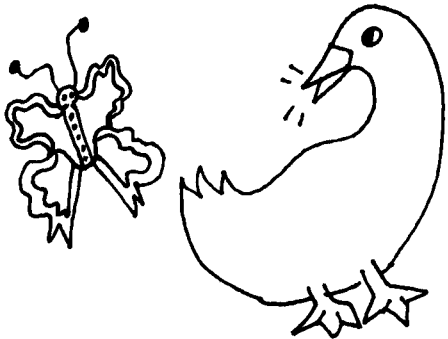
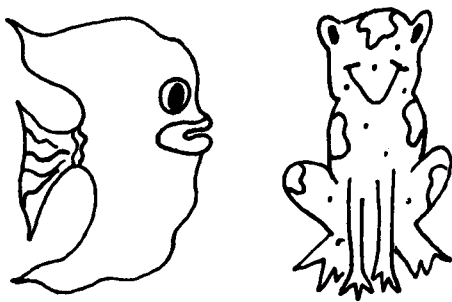
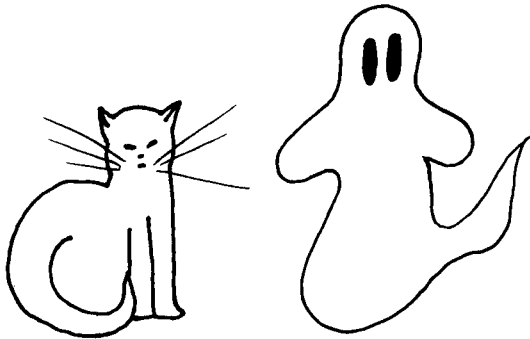
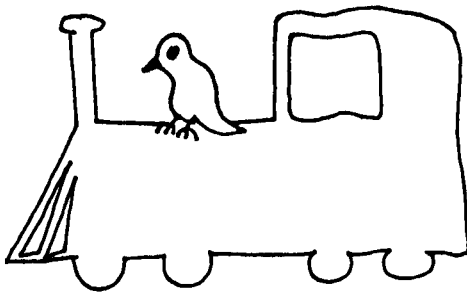

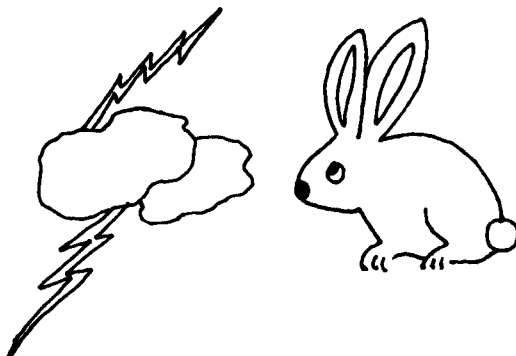
1. My head is \_\_\_\_\_ cm. long.
2. My tail is \_\_\_\_\_ in. long.
3. My hind legs are \_\_\_\_\_ cm. long.
4. I am \_\_\_\_\_ in. tall.
5. Which are longer—my front legs or my back legs? \_\_\_\_\_
6. Some of my teeth are 6" long. Six inches is about \_\_\_\_\_ cm.



## Loud and Soft Sounds

When an object vibrates, it produces sound. The ENERGY with which an object vibrates will determine whether the sound is LOUD or SOFT. When we turn up the volume on the TV or radio, it causes the sound waves to vibrate with more energy, and produces a louder sound. When we turn down the volume on the TV or radio, it causes the sound waves to vibrate with less energy, and produces a softer sound.

Compare the two objects in each box below. With your green crayon, draw a circle around the object that would make the softer sound. All loud-sounding objects can be colored a loud red or loud orange!

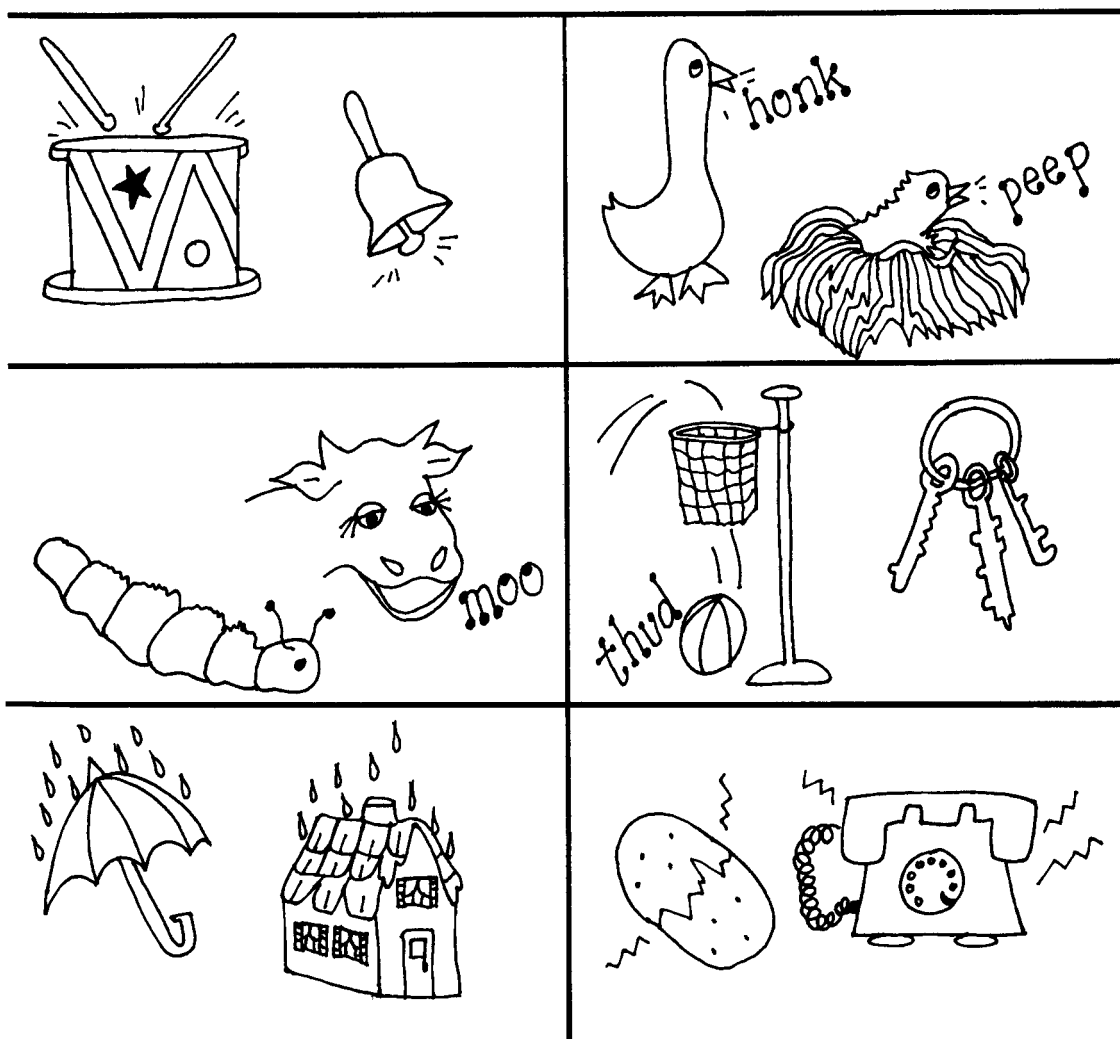


# High Sounds and Low Sounds

Objects that **VIBRATE** produce sound. The speed of the vibrations is called “pitch.” The faster the vibration, the higher the pitch. The slower the vibration, the lower the pitch.

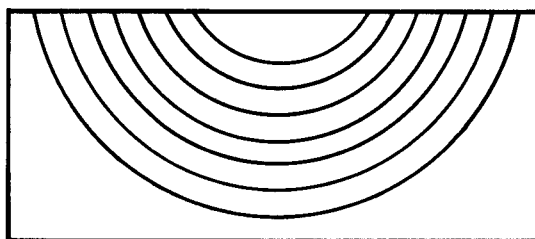
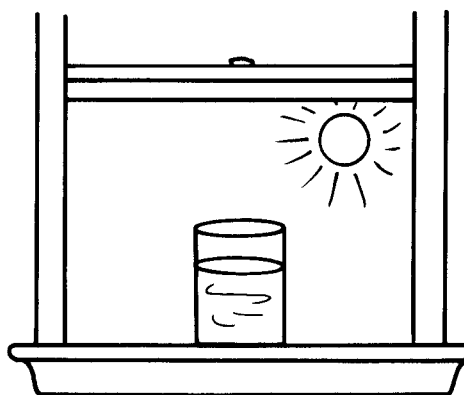
Compare the two objects in each box below. With your red crayon, draw a circle around the object that would make the higher sound. Color the object that would make the lower sound.

When you finish, close your eyes. Listen for a high sound. Then listen for a low sound. Turn over this paper, and draw the two objects that made the different sounds.

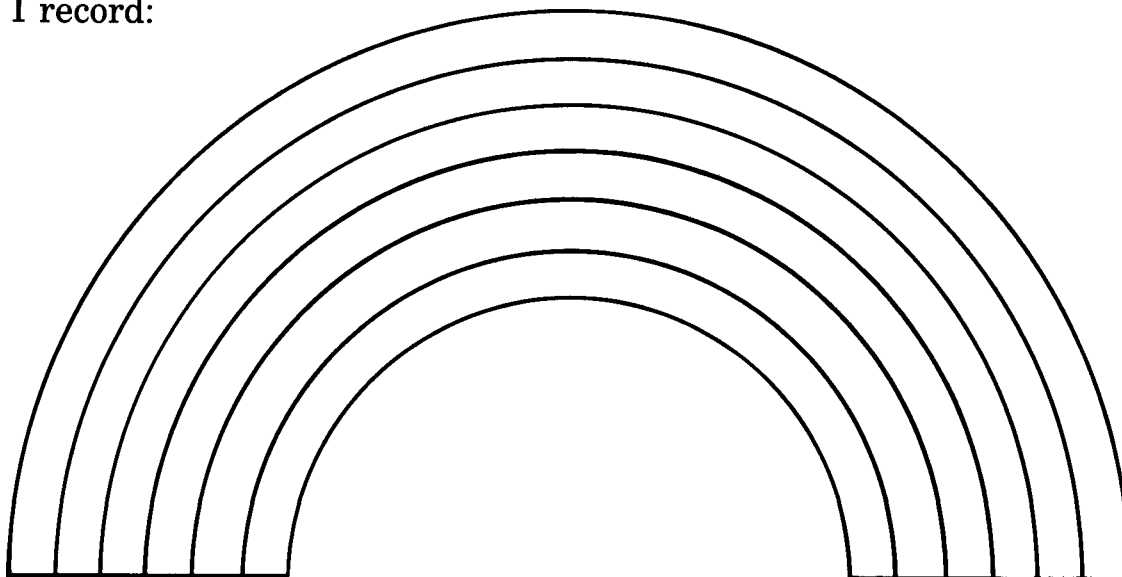


# Over the Rainbow

I observe:

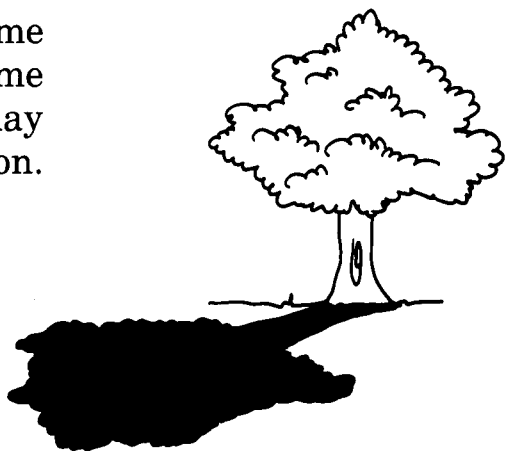


I record:



# A Shadow Record

Do shadows remain the same size all day? Let’s measure some shadows at different times today to be able to answer that question.



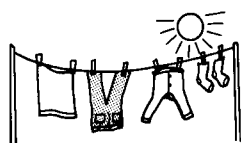
LENGTH OF SHADOW AT THESE TIMES

Shadows	10:00 a.m.	Noon	2:00 p.m.
1. Flagpole			
2. Tree on the Playground			
3. Other items: _____ _____ _____			



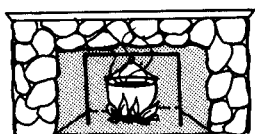
# Back to Nature?

Some appliances are made to give off heat while others are designed to keep heat out. Look at the natural way to accomplish some tasks. Then draw the appliance invented to do the job artificially.



1. Once the sun was used to dry out clothes.

Now many people use a \_\_\_\_\_.



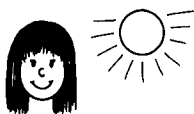
2. Cooking on an open fire or fireplace was the natural way.

Now everyone uses a \_\_\_\_\_.



3. Cooling system offered by nature was a stream or spring.

Now we absolutely have need of a \_\_\_\_\_.



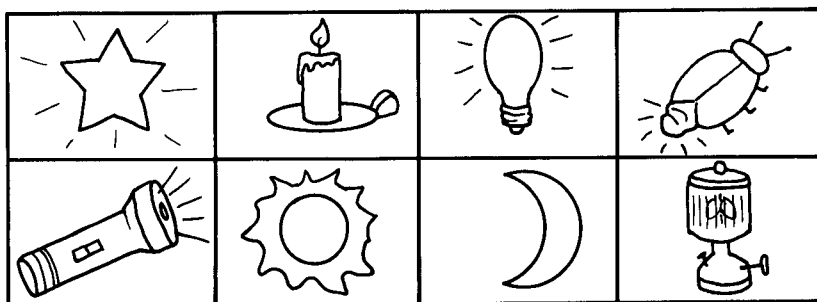
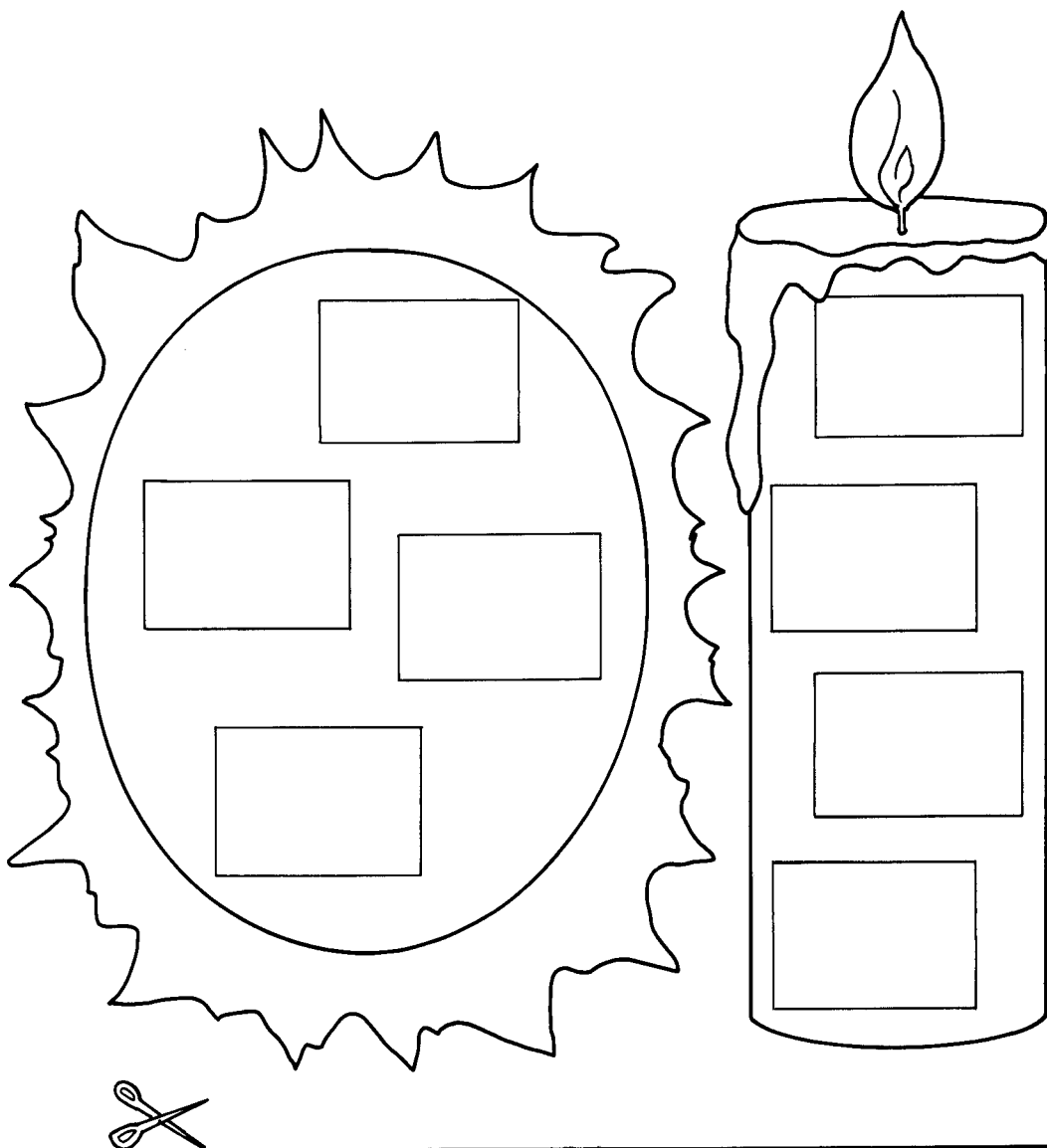
4. The sun or air drying was a way of drying hair.

Now you cannot imagine life without a \_\_\_\_\_.

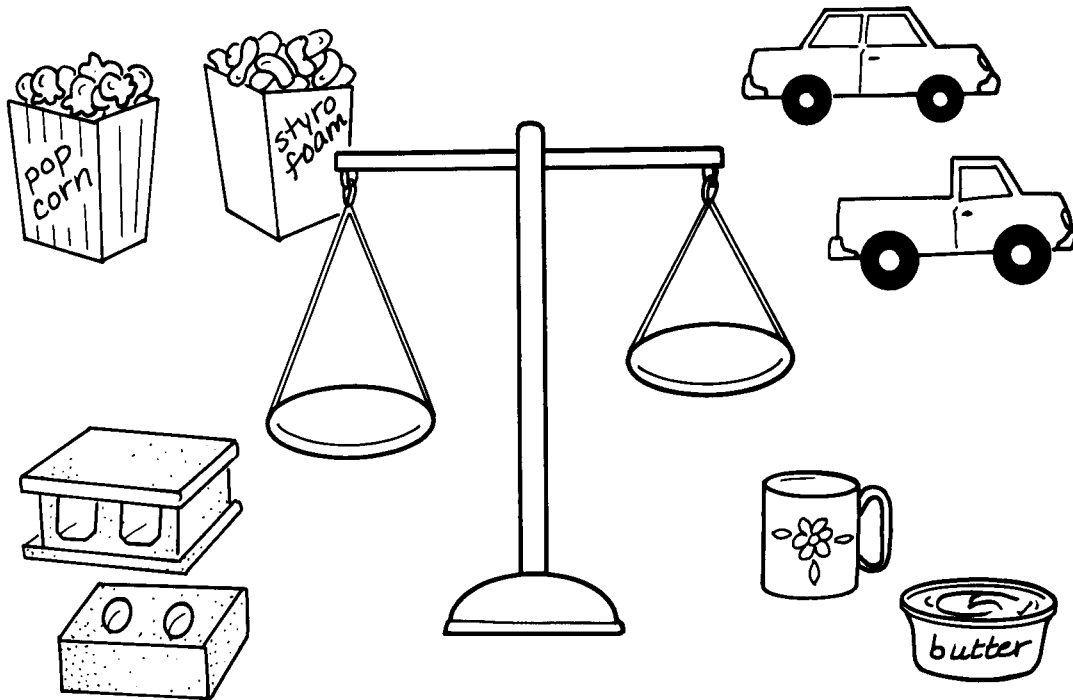


# Light the Lights!

Cut out the pictures at the bottom of this sheet and paste each one on the correct object. The sun is for natural light, and the candle is for man-made.



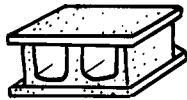
# Guess and Check



Which is heavier?



BRICK



BLOCK

1. My guess is \_\_\_\_\_.

\_\_\_\_\_ is heavier.



YES!



OOPS!



POPCORN



STYROFOAM

2. My guess is \_\_\_\_\_.

\_\_\_\_\_ is heavier.



YES!



OOPS!



CAR



TRUCK

3. My guess is \_\_\_\_\_.

\_\_\_\_\_ is heavier.



YES!



OOPS!



MUG



TUB

4. My guess is \_\_\_\_\_.

\_\_\_\_\_ is heavier.



YES!



OOPS!



# Shadow Drawings

With the help of a friend, draw your shadow outside in the morning, at noon, and at night using a piece of chalk. Then answer these questions.

1. Why did the drawings of your shadow change?

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2. Predict where your shadow would be at 4:00 p.m. Why?

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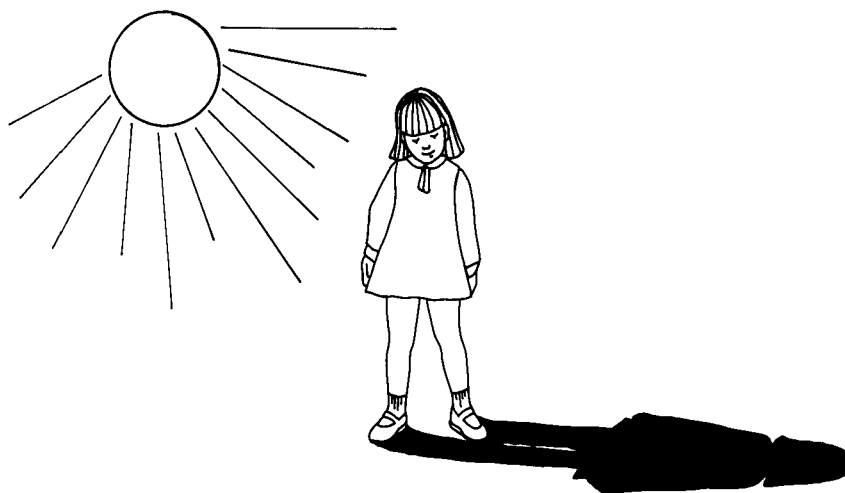
3. Why wouldn't you be able to draw your shadow at midnight?

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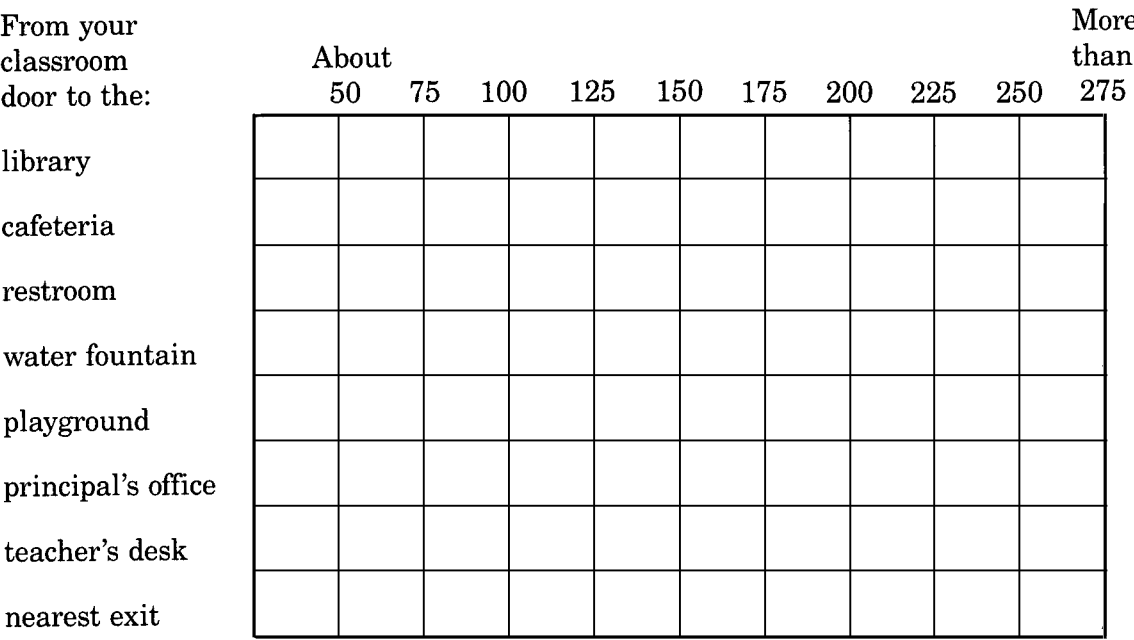
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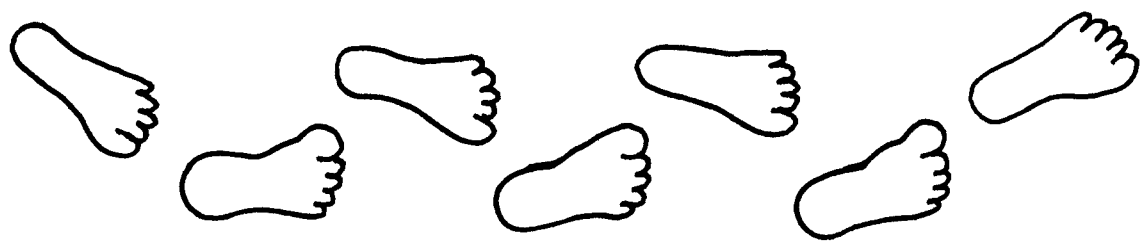


# Stepping Out!

By taking ordinary walking steps, count how far it is to the places below. Mark the point on the graph and draw a line to it. Compare your graph with a friend's graph.



1. The shortest distance was to the \_\_\_\_\_ .
2. The longest distance was to the \_\_\_\_\_ .
3. Two distances that were about the same were to the \_\_\_\_\_ and the \_\_\_\_\_ .
4. Did your answers match your friends'? \_\_\_\_\_ .
- Why or why not? \_\_\_\_\_
- \_\_\_\_\_ .



# What Will It Be?

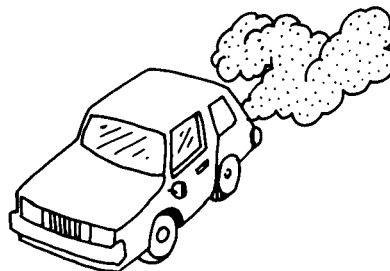
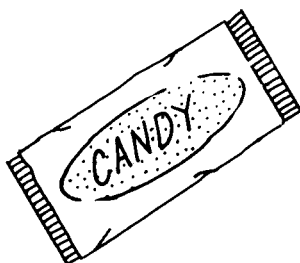
Is it a liquid, a solid, or a gas? Write each of the items below under the correct heading.

FROZEN LEMONADE  
WATER  
ICE CUBE  
STEAM  
ORANGE JUICE

FUMES FROM AN AUTOMOBILE  
MELTED CHOCOLATE  
CANDY BAR  
FROST IN THE FREEZER

Can you think of others to add under each category?

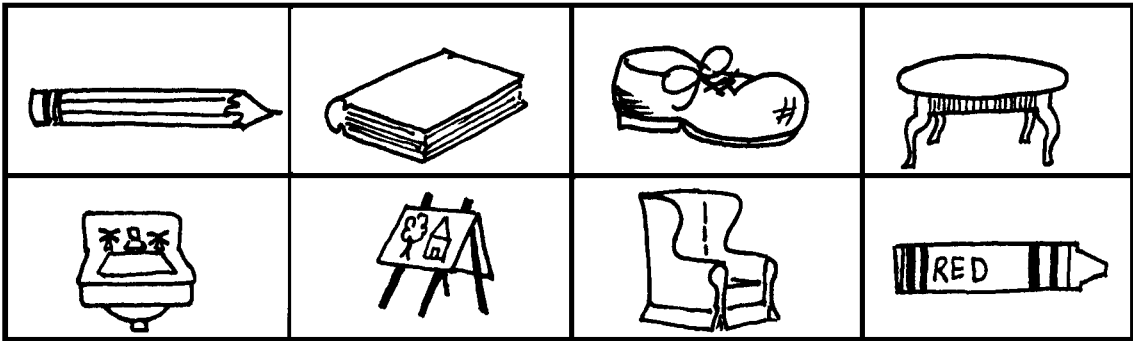
LIQUID	SOLID	GAS



# Big Foot

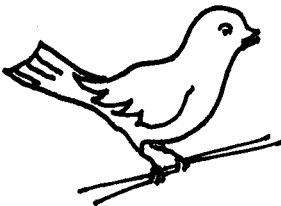
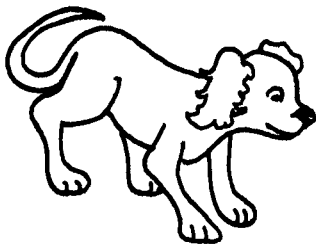
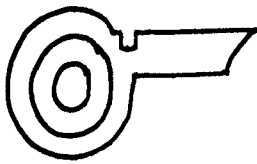
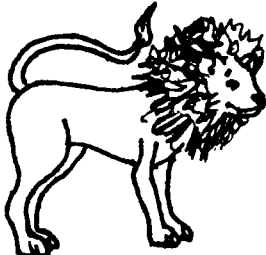



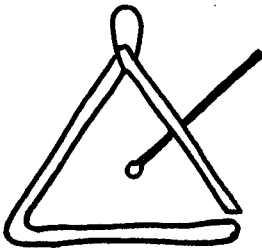
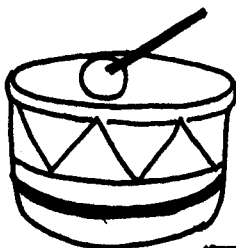
Measure the objects below with the “foot” your teacher gives you. If the object is shorter than the foot, cut it out and paste it under the word SHORTER. If it is longer, paste it under the word LONGER.

SHORTER	LONGER



# Listen!

Look at the pictures. Put an "H" in the box if it makes a high pitched sound. Put an "L" in the box if the sound is low pitched. Color the pictures.

 <input data-bbox="467 724 544 798" type="checkbox"/>	 <input data-bbox="868 745 941 808" type="checkbox"/>	 <input data-bbox="1242 724 1315 798" type="checkbox"/>
 <input data-bbox="479 1144 560 1228" type="checkbox"/>	 <input data-bbox="873 1144 950 1228" type="checkbox"/>	 <input data-bbox="1242 1144 1315 1228" type="checkbox"/>
 <input data-bbox="500 1549 576 1633" type="checkbox"/>	 <input data-bbox="873 1564 950 1648" type="checkbox"/>	 <input data-bbox="1247 1564 1323 1648" type="checkbox"/>






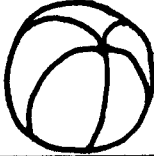







# What Am I?

Cut out the pictures below. Paste them in the correct place.

GAS	LIQUID	SOLID

# High or Low?

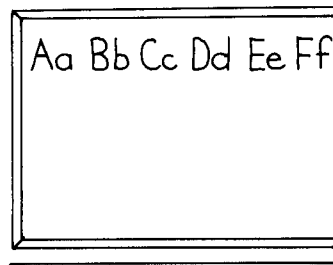
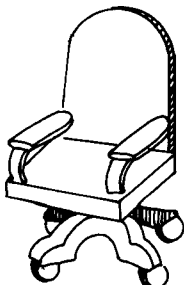
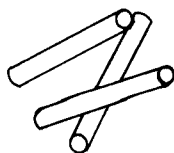
Let's try an experiment. Follow these steps:

1. Using a tuning fork, identify high and low sounds of objects in the classroom.
2. Place your tuning fork on the following objects. Record each object under the correct heading below:

chalkboard	classroom chair
teacher's chair	chalk
student's desk	art paper
classroom window	classroom closet

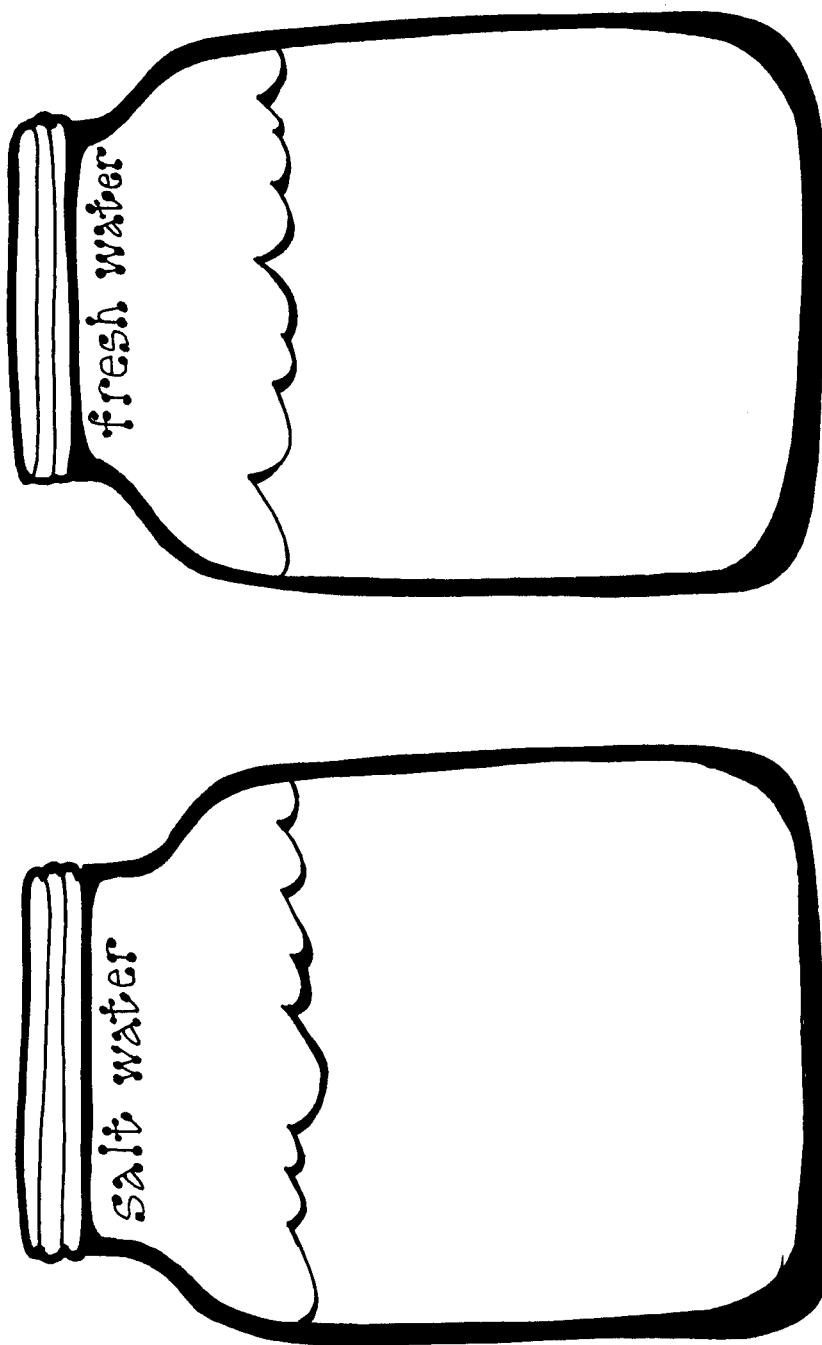
3. Try other objects in the classroom, too, and add these to the list under the correct heading.

HIGH SOUND	LOW SOUND

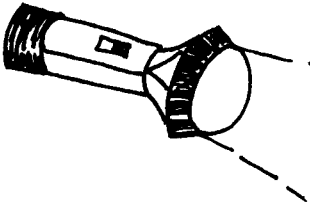


# Buoyancy Experiment

Fill two jars with water. Add salt to one jar until no more will dissolve. Gently place a hard-boiled egg in each jar. On the two jars below, use your crayons to show where the egg stayed. Why does this happen? Where can we find out?



# Light



In small groups, predict what will happen when you shine a flashlight through transparent, opaque, and translucent materials.

I predict \_\_\_\_\_

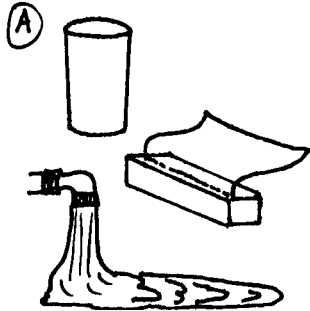
\_\_\_\_\_

I found that \_\_\_\_\_

\_\_\_\_\_

A transparent material is one that \_\_\_\_\_

\_\_\_\_\_



I predict \_\_\_\_\_

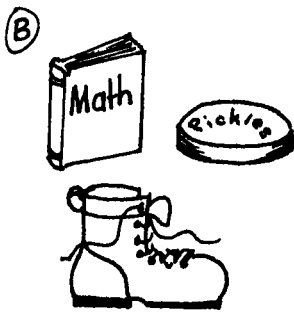
\_\_\_\_\_

I found that \_\_\_\_\_

\_\_\_\_\_

An opaque material is one that \_\_\_\_\_

\_\_\_\_\_



I predict \_\_\_\_\_

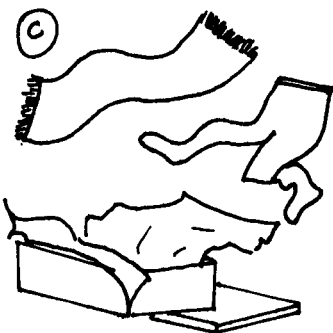
\_\_\_\_\_

I found that \_\_\_\_\_

\_\_\_\_\_

A translucent material is one that \_\_\_\_\_

\_\_\_\_\_



# Fun with Sound

**Experiment One:** Place a watch on one end of a wooden table.

1. When standing at the other end of the table, I \_\_\_\_\_

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---

2. When I put my ear on the table, I

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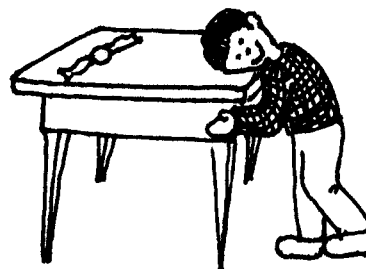
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3. My conclusion is: \_\_\_\_\_

---



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**Experiment Two:** Have a friend or your teacher hold a watch at one end of a cardboard tube.

1. When I place my ear at the other end, I heard \_\_\_\_\_

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Now, remove the tube, but have the friend or teacher hold the watch in the same place.

2. This time I heard \_\_\_\_\_

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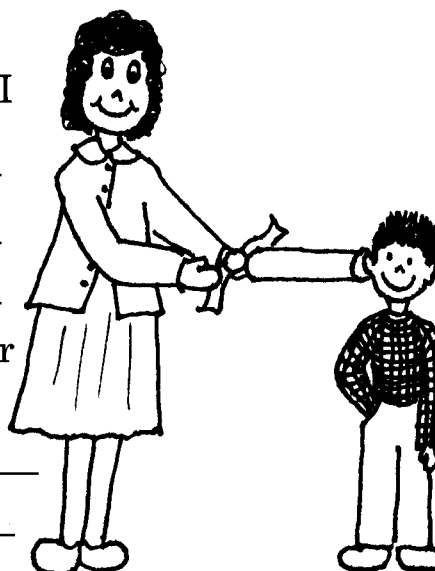
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3. My conclusion is: \_\_\_\_\_

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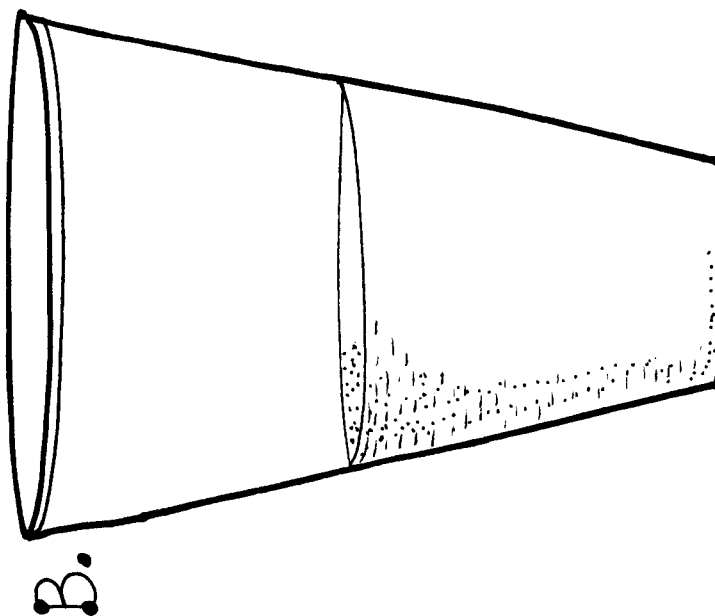
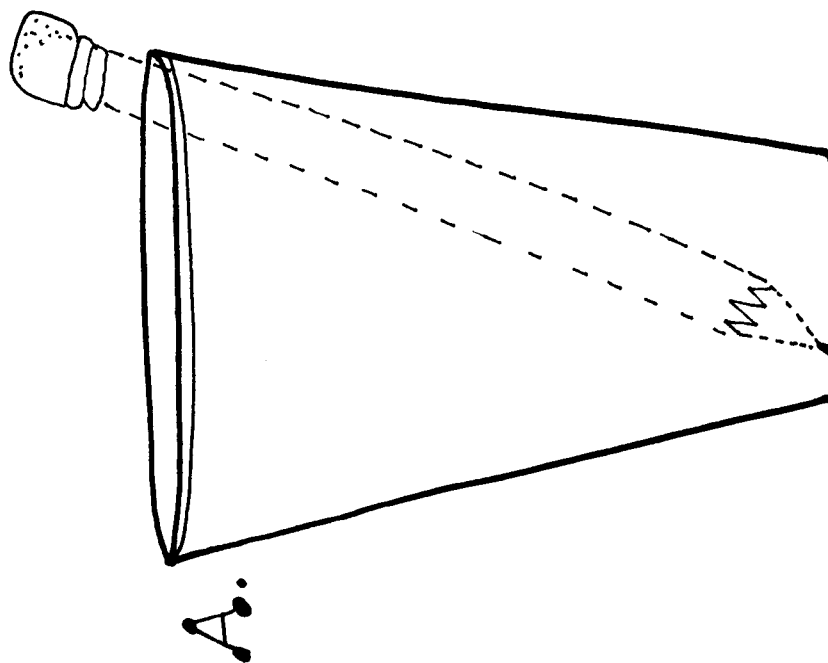


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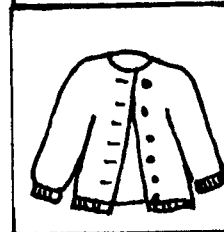
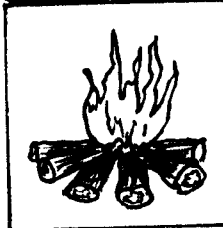
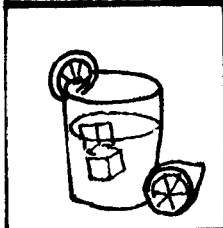
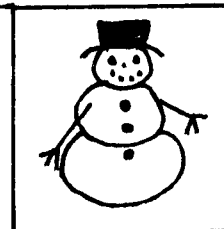
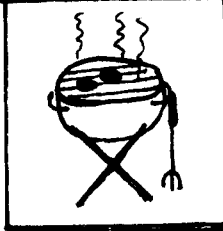
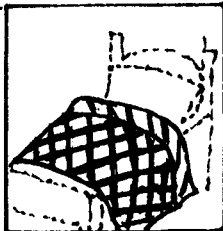
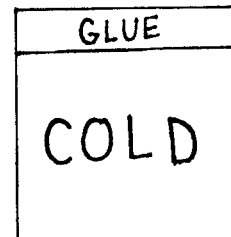
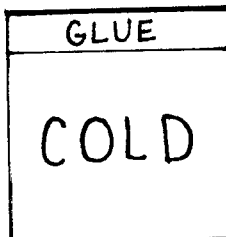
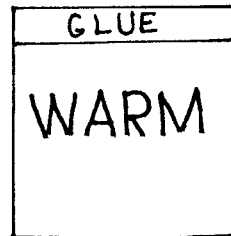
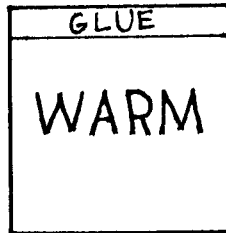
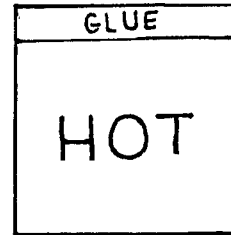
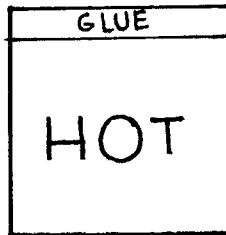
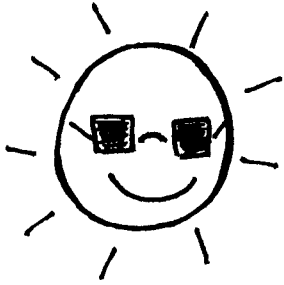
# Light Rays

Light rays bend when they pass through water. First do part A of this experiment, and view the pencil from the side. For part B, put water in the glass, stand back, and draw the pencil as it appears. Does it look straight?



# Heat!

Cut out the pictures at the bottom of this page. Paste the top part of the pictures onto the word that describes each one. Then lift the flap to read the word.



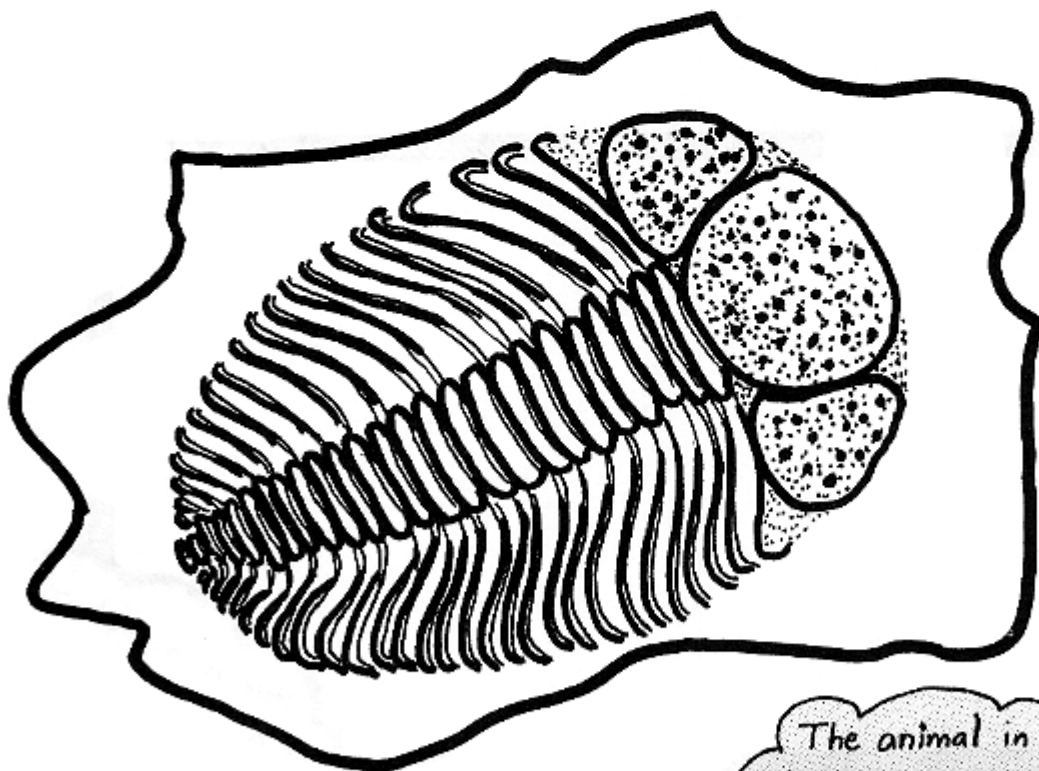
# All About Fossils

Fossils are rock prints of plants or 1. \_\_\_\_\_. These prints were made millions of 2. \_\_\_\_\_ ago. Plants and animals got buried under layers of dirt 3. \_\_\_\_\_. Pressure turned the layers to 4. \_\_\_\_\_.

Fossils are often 5. \_\_\_\_\_ far from where they formed. As time passed, the 6. \_\_\_\_\_ crust moved. Fossils of ancient sea animals are even found on mountainsides!

Write the correct word on each line.  
Use these words.

earth's  
found  
animals  
rock  
years  
and









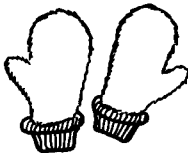

The animal in  
this fossil is a  
**Trilobite.**





# Play It Safe

**Directions:** Write the answer and color the picture.

<p>I make a loud noise.</p> <p>You hear me in a storm.</p> <p>I cannot hurt you.</p> <p>I am _____.</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <p>lightning</p> <p>thunder</p> </div>	<p>Do not stand under me in a storm.</p> <p>I attract lightning.</p> <p>I am a _____.</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <p>mushroom</p> <p>tree</p> </div>
<p>Use me when you are out in the sun.</p> <p>I can keep your skin from burning.</p> <p>I am _____.</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <p>sun lotion</p> <p>sun glasses</p> </div>	<p>Your fingers get cold in the snow.</p> <p>I can keep your hands warm.</p> <p>I am _____.</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <p>mittens</p> <p>ear muffs</p> </div>



# ANSWER KEYS

## THE BROWN BAG ENERGY TEST

**Objective:** Students will experiment and learn a methodology for determining which foods contain fat.

## MAKE SOME QUICK CLOUDS

**Objective:** Students will learn how clouds are formed.

## INVESTIGATING REFLECTION OF LIGHT

**Objective:** Students will discover that light reflects (bounces off) rough and smooth items at different angles.

**Directions:** This activity should be performed in either dim light or in a large darkened box.

## B.J. & T.J. BEAR DISCOVER LIGHT REFLECTIONS

**Objective:** Students will compare the angle of a ball as it approaches the floor with the angle of its path as it leaves the floor (the angles are the same).

## THE WHIP CREAM EXPERIMENT

**Objective:** Students will perform an experiment in order to learn that machines help us to work more quickly.

**Directions:** After performing the experiment, you can serve the whipped cream on fruit at snack time.

## NIGHT LIGHTS

**Objective:** Students will identify objects that transmit light at night.

**Answer Key:** ITEMS THAT GIVE OFF LIGHT—light bulb, candle, moon, firefly, stars, fire, flashlight; OBJECTS THAT COULD BE BROUGHT TO SCHOOL—light bulb, candle, firefly in a jar, flashlight.

## INCH BY INCH . . .

**Objective:** Students will identify the type of measurement for each instrument.

**Answer Key:** 1. tape measure—how long; 2. thermometer—how hot or cold; 3. clock—how long; 4. scale—how heavy; 5. thermometer—how hot or cold; 6. ruler—how long; 7. scale—how heavy.

## CREATING SHADOWS

**Objective:** Students will produce shadows after learning about light being blocked by opaque or translucent materials.

## COLOR COMBINATIONS

**Objective:** Students will mix primary colors to determine the secondary color that they produce; will record their findings by selecting the proper color to use.

**Answer Key:** red + yellow = orange; yellow + blue = green; red + blue = purple; red + yellow + blue = brown.

## MEASURE ME!

**Objective:** Students will demonstrate use of two kinds of rulers.

**Answer Key:** 1. 5 cm; 2. 4 in.; 3. 5 cm; 4. 6 in.; 5. back legs; 6. 15 cm.

## LOUD AND SOFT SOUNDS

**Objective:** Students will compare two items and determine the one that is loud.

## HIGH SOUNDS & LOW SOUNDS

**Objective:** Students will compare 2 items to determine the one that makes the high sound and the one that makes the low sound.

## OVER THE RAINBOW

**Objective:** Students will observe the colors that make up a rainbow and record the colors on paper.

**Directions:** Place a partially filled glass of water on a windowsill where sunlight streams in. Place a sheet of white paper on a table or the floor near the sunlight to observe the spectrum of colors. Point out that the colors always line up the same way. Discuss the three primary colors (red, yellow, blue) and demonstrate how secondary colors are made. Next, give each child colored chalk in the three primary colors. Have them color in the primary colors on the worksheet and then blend the chalk to form the secondary colors.

**Answer Key:** STARTING FROM THE TOP OF RAINBOW—red, orange, yellow, green, blue, violet.



### A SHADOW RECORD

*Objective:* Students will determine if shadows remain the same size all of the time and discuss why they do not.

### BACK TO NATURE

*Objective:* Students will identify and draw modern appliances that are related to natural heating and cooling.

*Directions:* This is a good time to discuss safety with electrical appliances. Brainstorm with the students and list good safety habits.

*Answer Key:* 1. clothes dryer; 2. stove/oven/microwave oven; 3. fan/air conditioner; 4. hair dryer.

### STEPPING OUT!

*Objective:* Students will measure and graph distance using walking steps.

### WHAT WILL IT BE?

*Objective:* Students will identify items in liquid, solid, and gaseous forms.

*Answer Key:* LIQUID—water, orange juice, melted chocolate; SOLID—frozen lemonade, ice cube, candy bar, frost in the freezer; GAS—steam, fumes from an automobile.

### BIG FOOT

*Objective:* Students will measure simple classroom objects to see if they are longer or shorter than one foot.

*Directions:* Draw and duplicate construction paper feet that are 12" long. Have the children cut them out for this measuring activity. Then have children compare their pencil, crayon, shoe, book, the classroom easel, table, chair, and sink with the "foot." The students can then complete the worksheet.

*Extension:* Use many of the "feet" to measure the classroom carpet, the width of the classroom, the length of a long table, the width of a bookcase, etc. Make a chart of these measurements with the children's help.

### LISTEN!

*Objective:* Students will determine high and low pitch.

### WHAT AM I?

*Objective:* Students will classify objects according to gas, liquid, or solid.

### HIGH OR LOW?

*Objective:* Students will determine high and low sounds using a tuning fork.

### BUOYANCY EXPERIMENT

*Objective:* Students will see that salt water has more density and is heavier than fresh water, which allows the egg to float.

*Directions:* For this experiment, you need jars, salt, water, and a hard-boiled egg.

### LIGHT

*Objective:* Students will predict and write findings when using a flashlight and objects that are transparent, opaque, and translucent; will write a definition of each term.

*Directions:* You need flashlights and the following items for each experiment—A. a clear glass, a sheet of clear food wrap, a dish of water; B. a book, a shoe, and a metal lid; C. white tissue paper, a silk scarf or similar piece of fabric, a pink or white nylon stocking. In the Science Corner allow students to discover the difference in light when green food coloring is added to clear water.

*Answer Key:* A. A transparent material is one that allows light to pass through; B. An opaque material is one that allows no light to pass through; C. A translucent material is one that allows some light to pass through.

### FUN WITH SOUND

*Objective:* Students will conduct simple experiments and reach conclusions about sound movement.



## LIGHT RAYS

*Objective:* Students will observe and record findings that objects appear bent in water due to reflected light.

*Directions:* For your own information, light waves reflecting off the pencil, under water, travel at a slightly different rate of speed. Objects appear magnified (larger) under water. Even fish look bigger under water.

## HEAT!

*Objective:* Students will glue the correct pictures onto the words “hot,” “warm,” and “cold.”

## ALL ABOUT FOSSILS

*Objective:* Students will complete information about fossils.

*Answer Key:* 1. animals; 2. years; 3. and; 4. rock; 5. found; 6. earth's.

## PLAY IT SAFE

*Objective:* Students will use riddles to understand safe weather practices.

*Answer Key:* thunder; tree; sun lotion; mittens.

